

Datalogger lot

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Datalogger IoT 課程



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Datalogger lot 介紹及開發環境建立

Datalogger lot 簡述



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Datalogger (by Kevin's Lab)



Partner Designed



Manual



Buy it



Tutorial



MCU

Part Number: RTL8720DF

32-bit KM4 (Arm Cortex-M33 compatible)

32-bit KM0 (Arm Cortex-M23 compatible)



MEMORY

512KB SRAM + 4MB Flash



KEY FEATURES

Integrated WiFi 4 (802.11 b/g/n 1x1) SoC

Dual-band, 2.4GHz or 5GHz

Bluetooth LE 5.0

Bluetooth high-power mode up to 10dB

Low Power Mode

Auto Download Mode

On-board PCB antenna

DC IN: 6V ~ 24V

DC OUT: 5V / 1A

Arduino Uno mounting holes

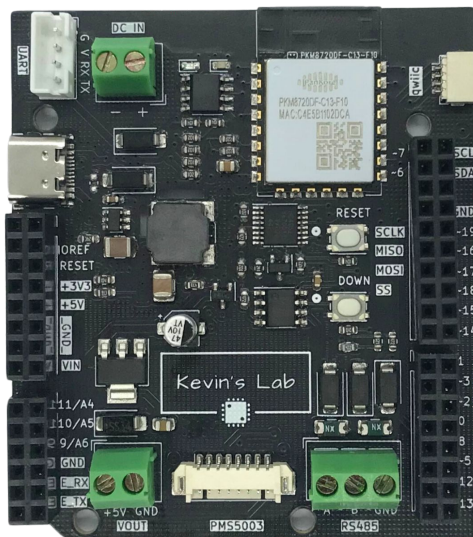
Popular Connectors: qwiic(I2C), UART(USART), RS485

UART expansion

RS485 with TVS + PTS protection and 120-ohm resistor

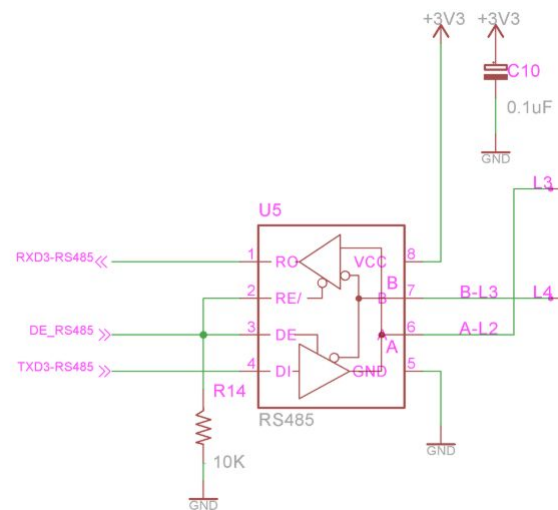
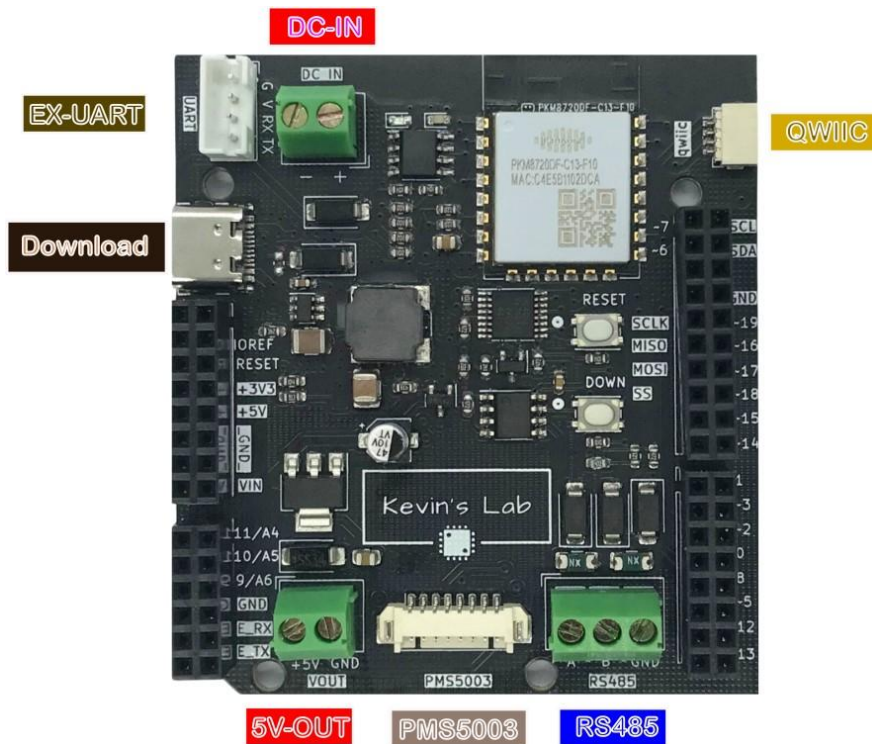
Datalogger lot 簡述

- 針對工業應用需求設計的 UNO 開發板
- 內建 qwiic 介面,支援多種 I2C 傳感器模組快速擴充
- 集成 RS485 通訊介面,內置 PTS 和 TVS 保護電路
- 內置專用 PMS5003 顆粒物傳感器連接器,方便接線
- 集成 RS485 通訊介面,內置 PTS 和 TVS 保護電路
- 內置專用 PMS5003 顆粒物傳感器連接器,方便接線



- 支援 12V~24V 直流電源輸入,適用於工業電源供應
- PCB 板上設有電源管理、過載和短路保護功能
- 擴展接腳包括 GPIO、ADC、PWM 等,滿足多樣化需求
- 附帶 Arduino IDE 開發環境和豐富的範例程式碼
- 體積小巧,適合嵌入式工業設備和現場監控應用
- 可廣泛應用於工業自動化、環境監測、智慧城市等領域

Datalogger Iot 簡述

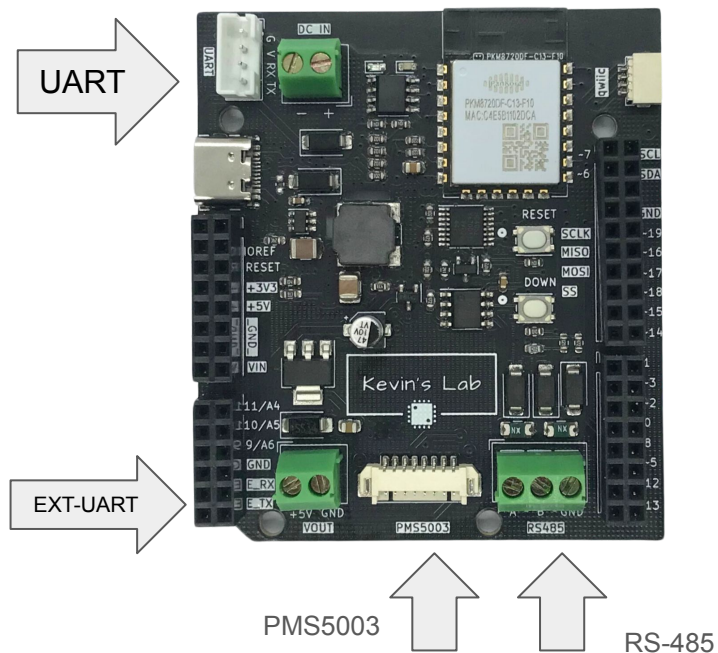


- RS485 電路已有 120 歐姆 電阻
- DE - /RE 不需要控制

Datalogger lot 簡述

- RS-485 基本介紹及應用
 - <https://youtu.be/kVcQPMIYbYw>
- 工具軟體及簡報
 - <https://reurl.cc/ZZ3RoM>

UART 擴充



Share UART2 (Serial2).	S1	S0
PMS5003	0	0
RS485	0	1
UART (JST 2.0mm)	1	0
EXT-UART	1	1

切換UART 使用方法

<https://www.amebaiot.com/zh/amebad-amb26-arduino-getting-started/>

	GPIO pin	GPIO INT	ADC	PWM	UART
0	PA15	✓			
1	PA14	✓			
2	PA13	✓		✓	SERIAL2_RX
3	PA12	✓		✓	SERIAL2_TX

```
#define S0 1
#define S1 0

void setup() {

    pinMode(S0, OUTPUT);
    pinMode(S1, OUTPUT);

    digitalWrite(S0, LOW);
    digitalWrite(S1, HIGH);

}
```

切换UART 使用方法

```
#define S0 1
#define S1 0

int chr;
void setup() {
    // put your setup code here, to run once:
    Serial.begin(115200);
    Serial2.begin(9600);

    pinMode(S0, OUTPUT);
    pinMode(S1, OUTPUT);

    digitalWrite(S0, LOW);
    digitalWrite(S1, HIGH);

    delay(500);

    Serial2.println("TEST Serial");
}
```

Serial_read_test.ino

```
void loop() {
    // put your main code here, to run repeatedly:

    if(Serial2.available()){
        while((chr = Serial2.read()) > 0){
            Serial2.println(char(chr));
        }
    }
    delay(100);

    //Serial2.println("TEST Serial");
    delay(500);
}
```

切換UART 使用方法

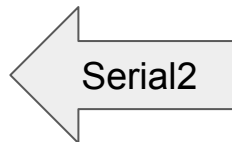
<https://www.amebaiot.com/zh/amebad-amb26-arduino-getting-started/>

PMS3003_AirQuality.ino

	GPIO pin	GPIO INT	ADC	PWM	UART
0	PA15	✓			
1	PA14	✓			
2	PA13	✓		✓	SERIAL2_RX
3	PA12	✓		✓	SERIAL2_TX

```
#include <SoftwareSerial.h>

SoftwareSerial mySerial(2, 3); // RX, TX
```

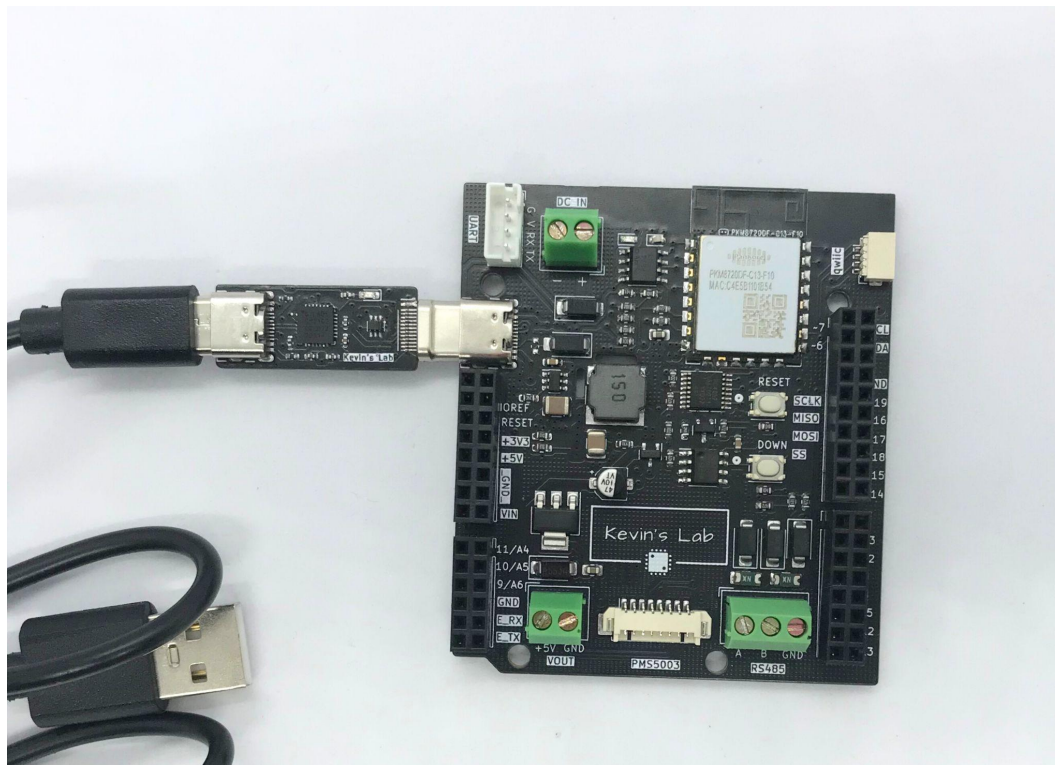


- USB 上傳工具驅動程式
- Arduino IDE 安裝
- 執行 Blink 程式測試

USB 上傳工具



USB 上傳工具



@毛老入數位 2025/3/8

USB 上傳工具

將USB 上傳工具接入 Type-C 及電腦

如果在 裝置管理員 出現 驚嘆號,

表示需要安裝驅動程式



USB 上傳工具

開啟網頁:

<https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers?tab=downloads>

USB 上傳工具

Windows 選擇

CP210x Windows Drivers

Mac 選擇

CP210x VCP MAC OSX Driver

Software Downloads

[Software](#) (10)

Software · 10

CP210x Universal Windows Driver	v11.3.0 6/24/2023
CP210x VCP Mac OSX Driver	v6.0.2 10/27/2021
CP210x Windows Drivers	v6.7.6 9/4/2020
CP210x Windows Drivers with Serial Enumerator	v6.7.6 9/4/2020
CP210x_5x_AppNote_Archive	9/4/2020
CP210x_VCP_Win2K	9/4/2020
Linux 2.6.x VCP Revision History	9/4/2020
Linux 3.x.x/4.x.x/5.x.x VCP Driver	v3.x.x/4.x.x/5.x.x 1/29/2021
VCP Driver for WinCE60	v2.1 9/4/2020
VCP Drivers for WinCE50	v2.1 9/4/2020

USB 上傳工具

下載後，並解壓縮。找到

CP210xVCPInstaller_x64.exe

並執行它

USB 上傳工具

按下一步繼續，

按指示安裝。

CP210x USB to UART Bridge Driver Installer



Welcome to the CP210x USB to UART Bridge Driver Installer

This wizard will help you install the drivers for your CP210x USB to UART Bridge device.

若要繼續，請按 [下一步]。

< 上一步(B)

下一步(N) >

取消

USB 上傳工具

重新拔插 Type-C

下載及安裝 Arduino IDE

下載點

arduino.cc/en/software



Arduino IDE 2.1.0

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

For more details, please refer to the [Arduino IDE 2.0 documentation](#).

Nightly builds with the latest bugfixes are available through the section below.

DOWNLOAD OPTIONS

Windows Win 10 and newer, 64 bits

Windows MSI installer

Windows ZIP file

Linux Appliance 64 bits (X86-64)

Linux ZIP file 64 bits (X86-64)

macOS Intel, 10.14: "Mojave" or newer, 64 bits

macOS Apple Silicon, 11: "Big Sur" or newer, 64 bits

[Release Notes](#)

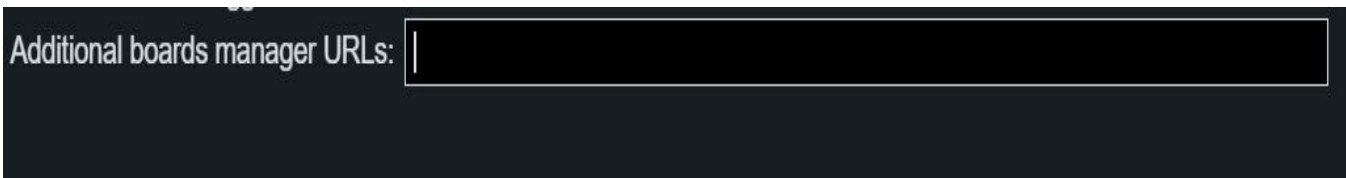
Arduino 設定

複製以下連結

https://github.com/ambiot/ambd_arduino/raw/master/Arduino_package/package_realtek_amebad_index.json

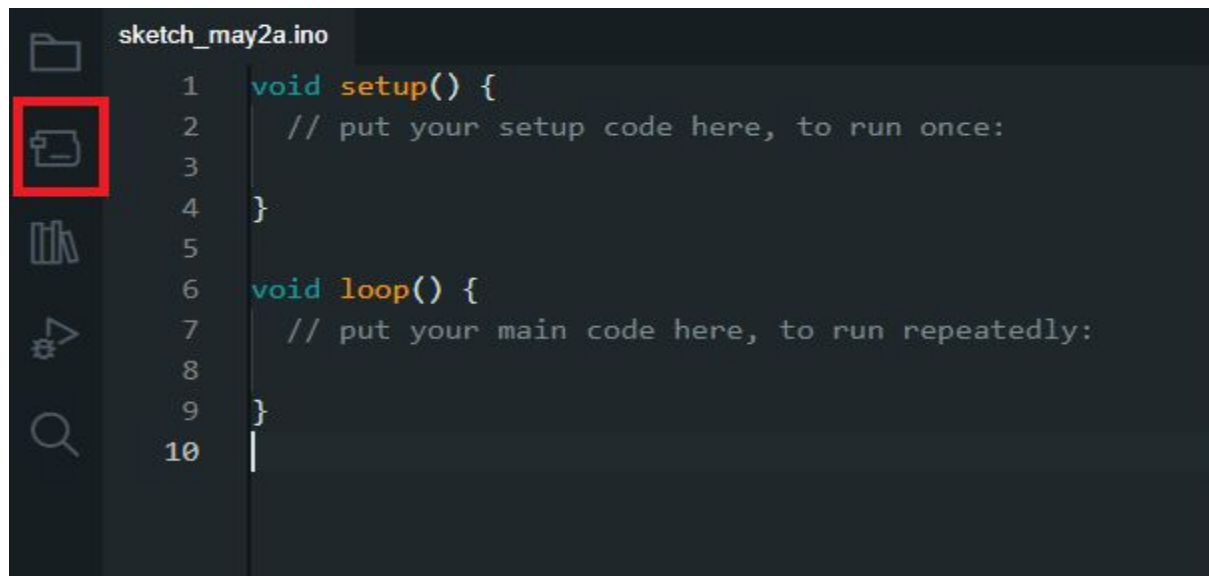
開啟 File / preferences

在 Additional boards manager URLs 的欄位 貼上 上述網址, 點 OK
結束設定



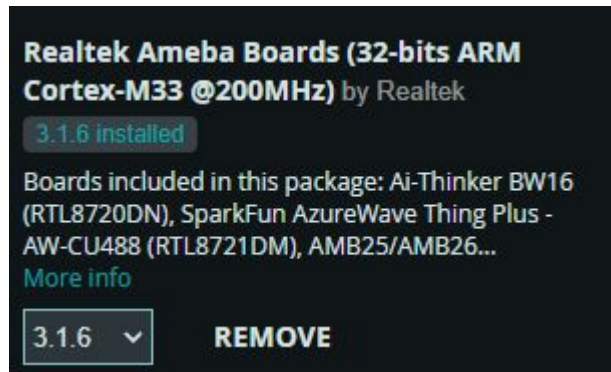
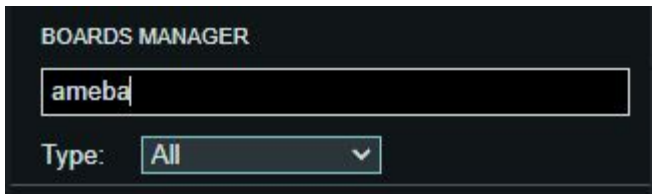
Arduino 設定

點取左側 第二個圖示， Boards Manager



開發環境安裝 - Arduino 設定

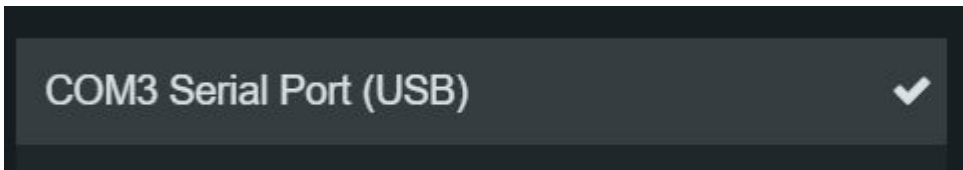
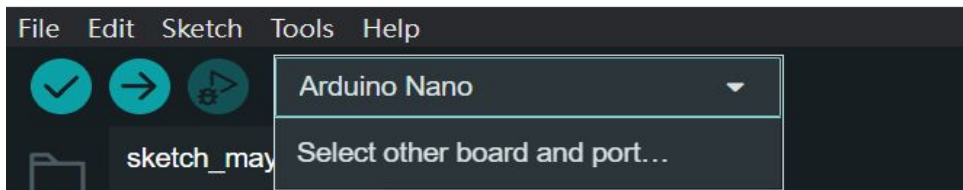
輸入 ameba



選擇 Realtek Ameba Boards (32-bits ARM Cortex-M33 @200MHz)
[建議安裝 V3.1.6 版本](#) , V3.1.7 不建議

開發環境安裝 - Arduino 設定

透過 USB 連接 開發板

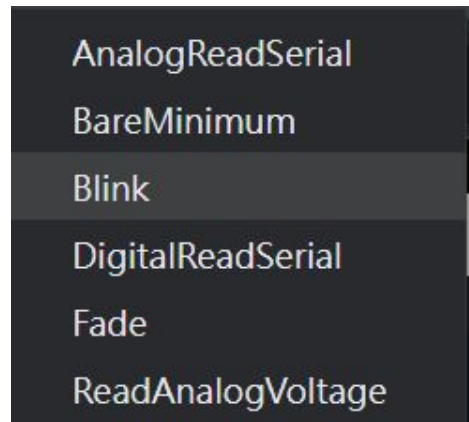
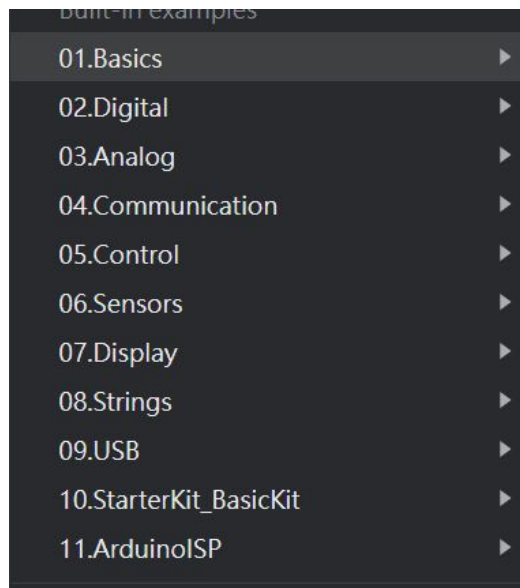
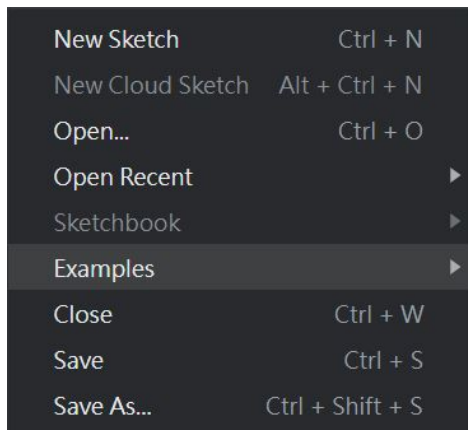


選擇 Select other board and port

Board 選擇 AMB25/AMB26(RTL8720DF)

第一個程式

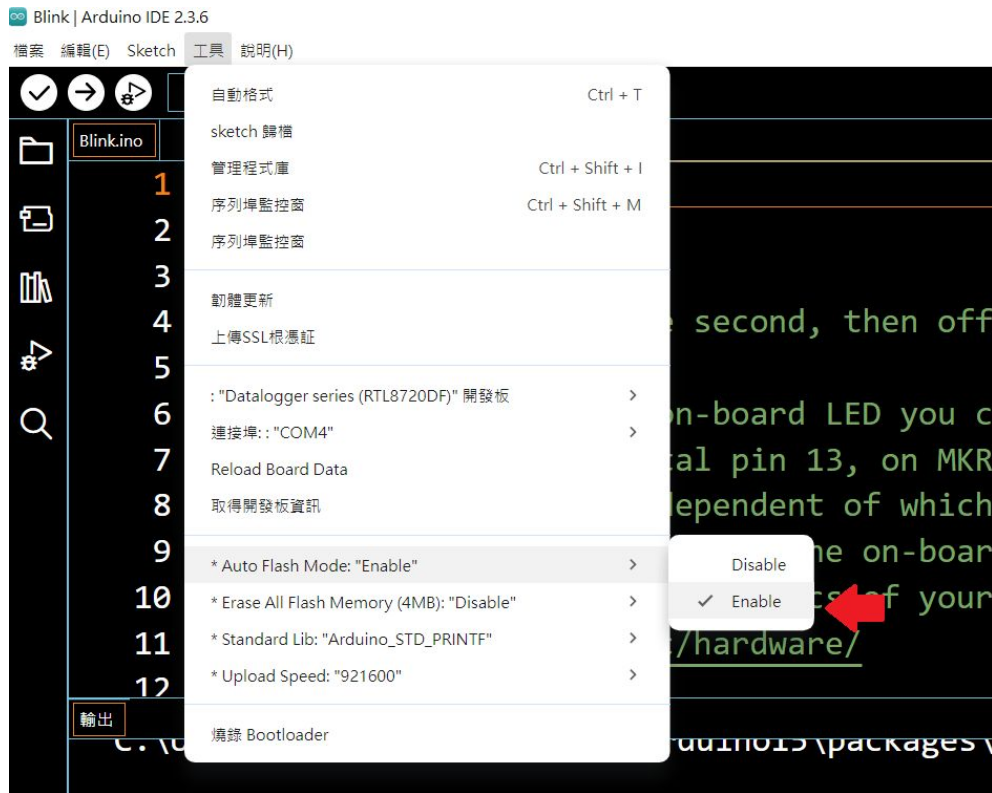
打開 File / Examples / 01.Basics / Blink



第一個程式

工具 / Auto Flash Mode

選擇 Enable



第一個程式

執行上傳



常用程式庫安裝及使用

常用程式庫安裝及使用

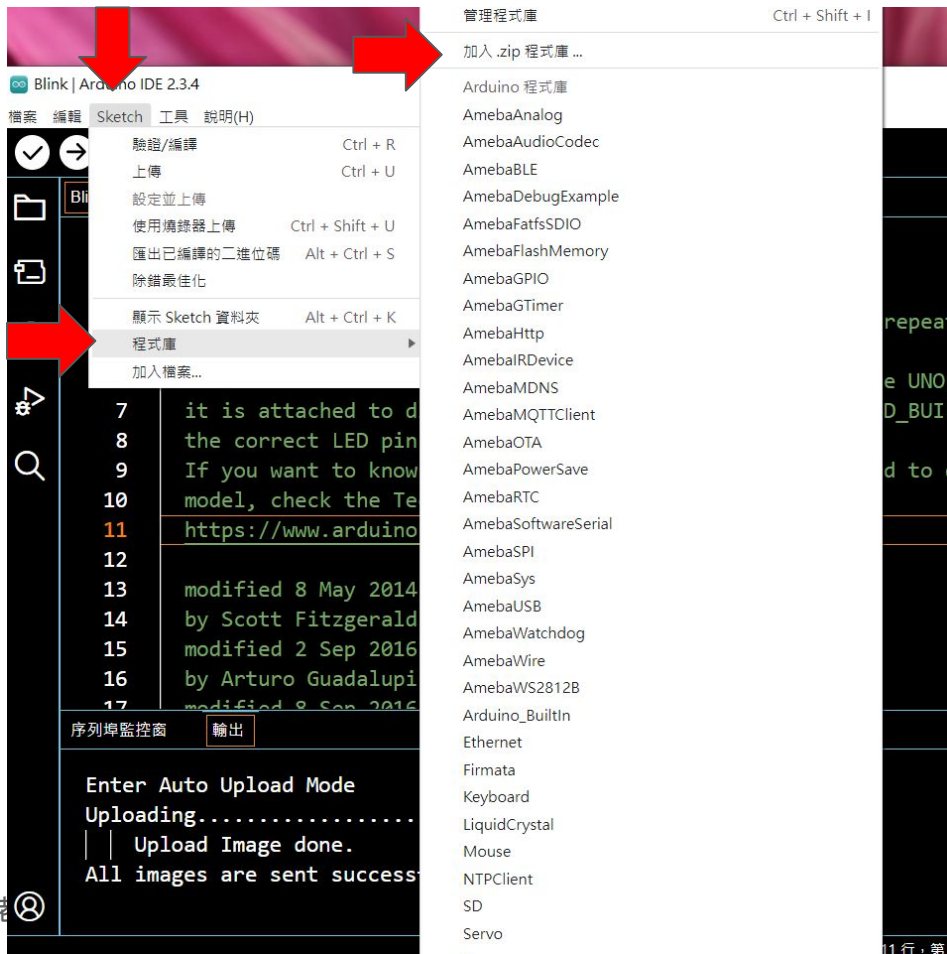
- 範例程式及資料 (操作手冊及程式庫)
 - https://github.com/cold63/Datalogger_lot/tree/main

The screenshot shows the GitHub repository page for **Datalogger_lot** by user **cold63**. The repository is marked as **Public**. At the top right, there are buttons for **Pin** and **Unwatch**. Below the repository name, it shows **main** as the selected branch, with **2 Branches** and **0 Tags** available. A search bar labeled **Go to file** and buttons for **Add file** and **Code** are present. The main content area displays a list of recent commits:

Commit Message	Commit Hash & Time	Commits Count
Merge pull request #24 from cold63/master	7fc850c · 35 minutes ago	55 Commits
libraries	upload library, sd card and rs485	36 minutes ago
src	update data	last week
tools	add software tool , serial port utility	2 weeks ago
Datalogger開始_安裝及使用_V1_0.pdf	update user	last week
README.md	update README.md	4 months ago

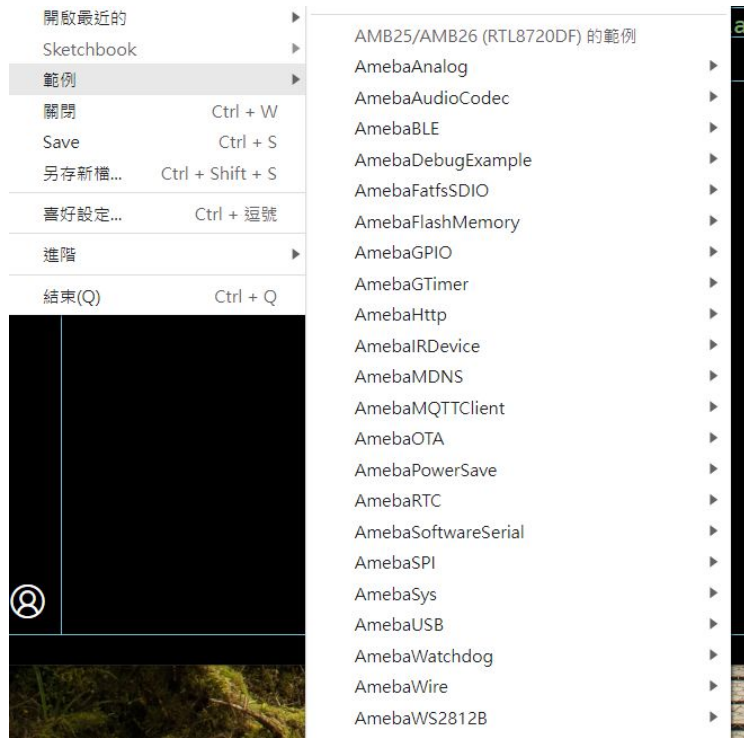
常用程式庫安裝及使用

安裝 Zip 程式庫的方法



常用程式庫安裝及使用

Realtek 提供的 Arduino 範例



常用程式庫安裝

- RS-485
 - [ModbusMaster](#) by Doc Walker (Arduino IDE 安裝)
 - [Modbus-Master-Slave-for-Arduino](#) (下載安裝)
- SD Card
 - [SdFat](#) (下載安裝)
- Oled
 - u8g2

Zip 封裝的程式庫下載點

https://github.com/cold63/Datalogger_lot/tree/main/libraries

ModbusMaster 提供者：Doc Walker

2.0.1已安裝

Enlighten your Arduino to be a Modbus master. Enables communication with Modbus...

[詳細資訊](#)

2.0.1 ▾

移除

U8g2 提供者：oliver
<olikraus@gmail.com>

2.35.30已安裝

Monochrome LCD, OLED and eInk Library. Display controller: SSD1305, SSD1306, SSD1309,...

[詳細資訊](#)

2.35.30 ▾

移除

常用程式庫安裝

- GPS
 - TinyGPSPlus by Mikal Hart



常用程式庫安裝

- SHT40溫溼度感測器
- SCD41 CO2感測器
- SGP41 VOC 感測器



- 更多說明

- 簡報 PPT

https://drive.google.com/file/d/1_ziPKTQeGlfK6sR4qf2s5Ucs9x7_mVnH/view?usp=drive_link

- 影片教學

<https://youtu.be/PnugtvNAYm4?si=vTWu-wSavQ1MqrZg>

- LoRa 擴展板

- **LoRa** (Arduino-LoRa)

- 影片教學

<https://youtu.be/6fWbL9OZpi4?si=70gOtnDco5rulTBp>

- 簡報 PPT

<https://reurl.cc/Kdbn3y>

